

## CLAIMS

What is claimed is:

1. A method, comprising:  
encoding a plurality of signals according to a predetermined negation scheme;  
transmitting said plurality of signals, each signal transmitted by way of a wireless channel;  
receiving a signal, wherein said signal is a combination of the plurality of transmitted signals;  
interpolating between data in the received signal to generate a plurality of systems of equations; and  
solving the plurality of systems of equations to determine a gain and phase shift applied to each of the plurality of transmission signals by a corresponding wireless channel.
2. The method of claim 1, further comprising using the gain and phase shift to eliminate distortion in received signals.
3. The method of claim 1, wherein encoding a plurality of signals comprises negating odd tones of negative frequency and even tones of positive frequency.
4. The method of claim 1, wherein encoding a plurality of signals comprises negating even tones of negative frequency and odd tones of positive frequency.

5. The method of claim 1, wherein encoding a plurality of signals comprises generating a plurality of signals with different contents.

6. A system, comprising:

a receiver adapted to generate a plurality of equations based on data in a received signal and by interpolating between data in said received signal;  
and

at least two transmitters, each transmitter wirelessly coupled to the receiver and adapted to transmit at least one signal by way of a wireless channel, said at least one signal encoded according to a predetermined negation scheme;

wherein the receiver solves the plurality of equations to determine a gain and phase shift applied to each transmitted at least one signal by a corresponding wireless channel.

7. The system of claim 6, wherein the receiver uses the gain and phase shift to eliminate distortion in received signals.

8. The system of claim 6, wherein the predetermined negation scheme is known to the receiver prior to generating a plurality of equations.

9. The system of claim 6, wherein each of the at least two transmitters encodes a signal using different frequency tones.

10. A system, comprising:
- a plurality of transmitters, each transmitter adapted to transmit by way of a wireless channel a set of frequency tones encoded according to a predetermined negation scheme; and
- a receiver wirelessly coupled to each of the plurality of transmitters, said receiver adapted to generate equations based on data and interpolations between said received data;
- wherein the receiver solves the equations to determine a gain and phase shift applied to each set of transmitted frequency tones by a corresponding wireless channel.
11. The system of claim 10, further comprising using the gain and phase shift to eliminate distortion in received signals.
12. The system of claim 10, wherein the predetermined negation scheme is known to the receiver prior to generating equations.
13. The system of claim 10, wherein each of the plurality of transmitters encodes a set of frequency tones comprising different data.
14. A receiver wirelessly coupled to a transmitter, comprising:

a processor adapted to generate a plurality of equations based on data in a received signal and by interpolating between data in said received signal;  
and

a memory coupled to said processor;

wherein the processor solves the plurality of equations to determine a phase shift and gain applied to a transmitted signal, said transmitted signal encoded according to a predetermined negation scheme;

wherein the processor stores said phase shift and gain in memory.

15. The receiver of claim 14, wherein the processor uses the phase shift and gain to eliminate distortion in received signals.

16. The receiver of claim 14, wherein the predetermined negation scheme is known to the processor prior to generating a plurality of equations.

17. A system, comprising:

a means for transmitting a plurality of preambles, each preamble comprising at least one set of frequency tones encoded according to a predetermined negation scheme; and

a means for receiving coupled by way of a wireless channel to the means for transmitting, said means for receiving adapted to generate a plurality of equations based on received frequency tones and interpolations between said received frequency tones;

wherein the means for receiving solves the plurality of equations to determine a phase shift and gain applied to each of the at least one set of frequency tones by the wireless channel.

18. The system of claim 17, wherein the means for receiving uses the phase shift and gain to eliminate distortion in received signals.

19. The system of claim 17, wherein each of the plurality of preambles comprises different frequency tones.

20. The system of claim 17, wherein the predetermined negation scheme is known to the means for receiving prior to separating each received preamble.